the spectra this morning, but have no doubt that they will prove to show the ordinary hydrocarbon spectrum.

The photographs taken last night at the Harvard Observatory show a tail at least nine degrees in length, and much longer than on previous nights.

EDWARD C. PICKERING
HARVARD COLLEGE OBSERVATORY,
October 31, 1908

SPECIAL ARTICLES

NOTE ON THE OCCURRENCE OF RHODOCHYTRIUM SPILANTHIDIS LAGERHEIM IN NORTH AMERICA

IN the *Botanical Gazette* for October, 1908,[1] there is published a note on the occurrence of this interesting parasite upon the leaves of the ragweed (*Ambrosia artemisiæfolia*) in North Carolina. This short note is published in the hope that some readers who do not have access to the *Gazette* may have their attention called to this organism and that they may be on the lookout for it in other sections.

The plant is an alga devoid of chlorophyll. It is parasitic on the leaves, stems, pedicels, flower bracts, etc. It begins its development in early summer on the small seedlings and by developing succeeding crops of zoospores continues infection of these same plants throughout the season, until finally the flower racemes are affected. The main body of the parasite forms sporangia which vary from 50 to 300 μ in diameter, the smaller ones being on the leaves. The plant has a reddish-yellow oil deposited in the protoplasm which is so massed in the larger sporangia that it causes a bright red color visible through the thin layer of cortical tissue, so that the plant has the appearance of being studded with minute red dots, suggesting a *Synchytrium*. The plant is always located in or adjacent to the vascular bundles. There is an extensive system of mycelial rhizoids which are profusely branched. These rhizoids extend both up and down. The terminal mycelium is provided with numerous haustoria, many of which are often applied very closely to the spiral ducts, but never entering them, so far as I have observed. The plant body remains connected with the outside wall by the entrance tube. The outer end of these tubes is broadened into a trumpet-like expansion which is the remains of the zoospore wall. The plant thus resembles a giant *Entophlyctis*. The outer end develops into a broad exit tube through which the zoospores escape. The zoospores are biciliated, containing a reddish-yellow oil which is accumulated in the forward end of the elliptical zoospore where the two cilia are attached. Many of the zoospores conjugate in pairs, this taking place during the process of swimming. When the zoospores come to rest, they become rounded and are 8–10 μ in diameter. The zygozoospores are considerably larger.

The resting spores are provided with a very thick wall which is divided into three layers. At maturity there is an abundance of the reddish-yellow oil in the resting spores which is withdrawn along with the protoplasm and starch from the rhizoid system. The rhizoids then become plugged where they join the main body of the sporangium. The inner wall of the resting spores is laid down entirely distinct from the other walls and forms a complete envelop around the content which can be separated distinctly as the endospore from the other walls. The sporangia as well as the rhizoids are provided with starch. Great masses of starch are present in the sporangia. This starch is not, however, manufactured through the photosynthetic process by the organism, but is obtained from the host.

This organism, *Rhodochytrium spilanthidis* Lagerheim[2] was described by Lagerheim[2] fifteen years ago, from material collected on a species of *Spilanthes* in Ecuador. Though Lagerheim searched diligently on other genera he found it occurred only on *Spilanthes*. Here is then an interesting problem of distribution. Collectors in the southern part of

[1] Atkinson, G. F., "A Parasitic Alga, *Rhodochytrium spilanthidis* Lagerheim, in North America," *Bot. Gaz.*, 46, 299–301, 1908.

[2] Lagerheim, G. de, "*Rhodochytrium*, nov. gen., eine Uebergangsform von den Protococcaceen zu den Chytridiaceen," *Bot. Zeit.*, 51, 43–53, pl. 2, 1893.

the United States, Mexico and other tropical and subtropical countries could do an important service by the discovery of this plant. It will be interesting to know whether it is distributed through the intervening region between North Carolina and Ecuador, or whether it is more probable that it has been introduced through the agency of commerce from one country to another. My attention has recently been called to the fact that a form of this plant was distributed in Ellis & Everhart's "Fungi Columbiani" No. 2166 collected on *Asclepias pumila* at Stockton, Kansas, July 18, 1904, by E. Bartholomew and determined by Dr. Farlow as forma *asclepiadis* Farl. The rhizoid system does not seem to be nearly so well developed in this form as in that on the ragweed. This not only shows a greater geographic range, but also an extension to genera outside of the Compositæ. It ought to be found on other hosts. The writer will be pleased to receive specimens from other sections if they are found.

The plant was discovered in North Carolina by Dr. F. L. Stevens. Since the note was written for the *Gazette,* Dr. Stevens has given additional notes on the occurrence of the plant. The first collection was made in August, 1903, at West Raleigh. It occurs there every year in great abundance. In many cases the ragweed is so affected that the distortion can be recognized from the car windows. The stems and leaves affected are more or less stunted, twisted and curled. Rarely the affected areas on the stems may be slightly greater in diameter.

Other locations in North Carolina, with dates on which it has been collected by Professor Stevens, are given herewith.

1. Polkton	August	1, 1908.
2. Clayton	"	2, 1908.
3. Carey	"	5, 1908.
4. McLeansburg	"	7, 1908.
5. Davidson	"	13, 1908.
6. Mt. Ulla	"	15, 1908.
7. Hiddenite	"	17, 1908.
8. Taylorsville	"	18, 1908.
9. Connelly Springs	"	20, 1908.
10. Connelly Springs	"	21, 1908.
11. Marion	"	21, 1908.
12. Rutherfordton	August	22, 1908.
13. Hendersonville	"	25, 1908.
14. Auburn	"	27, 1908.

Geo. F. Atkinson

THE PRESENT STATE OF OUR KNOWLEDGE OF THE ODONATA OF MEXICO AND CENTRAL AMERICA

The completion of the account[1] of the Odonata in the *Biologia Centrali-Americana* and the rather restricted circulation which the book must enjoy, owing to the necessarily expensive character of this series,[2] will perhaps justify the publication in Science of a summary of the main results obtained, and of a comparison with previous work done in this field.

The preparation of this volume successively undertaken by McLachlan, of London; Hagen, of Cambridge, Mass., and Karsch, of Berlin, and successively relinquished by each of them under the pressure of ill-health or of other work, was entrusted to the present writer in the beginning of 1899.

The material on which it is based was primarily that acquired for the purpose by Dr. Godman, editor of the *Biologia,* and his associate, the late Osbert Salvin, F.R.S., but thanks to the directors, curators and owners of public and private museums, a still larger series of specimens has been available. It is, therefore, a great pleasure to acknowledge the aid thus rendered by the Academy of Natural Sciences of Philadelphia, the United States National Museum, the Museum of Comparative Zoology, the American Museum of Natural History, the Carnegie Museum of Pittsburg, the California Academy of Sciences, the Field Columbian Museum, the late Robert McLachlan, F.R.S., and Messrs. E. B. Williamson, C. C. Adams, C. C. Deam, J. G. Needham, H. Kahl, O. S. Westcott and E. A. Smyth, Jr.

[1] "Odonata," by Philip P. Calvert, forming pages 17–420, v–xxx, plates II.–X., 1 map, of volume Neuroptera, *Biologia Centrali-Americana.* Edited by F. Ducane Godman, F.R.S., etc., London, 1901–8, 4to.

[2] A sketch of the *Biologia* was published in *Entomological News,* XVI., pp. 317–322, December, 1905.